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Rhodora

JOURNAL OF THE

NEW ENGLAND BOTANICAL CLUB

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Type of Betula Michauxii Spach (*B. nana* sensu Michaux, not L.). Michaux's writing at right, Spach's at left.

Rhodora

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THE NEW ENGLAND BOTANICAL CLUB

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BETULA MICHAUXII, A BRIEF SYMPOSIUM

1. INTRODUCTORY NOTE

M. L. Fernald

In his Flora Boreali-Americana, ii. 180, 181 (1803) André Michaux enumerated under true *Betula* five species: *B. nana* L., *B. glandulosa* Michx., *B. papyrifera* Michx. (with *B. papyracea* Ait. cited as a synonym), *B. lanulosa* Michx. [= *B. nigra* L.] and *B. carpinifolia* Michx. [= *B. lenta* L.]. All four of Michaux's own species had full and clearly stated descriptions and, quite naturally, it would be assumed that his diagnosis of *B. nana* was based on his own material so named:

NANA L. B. humillima, glaberrima: foliis perpusillis, subcuneato-orbiculatis, inciso-crenulatis, reticulato-venosis: amenti squamis profunde 3-partitis, laciniis oblongis: capsulis orbiculatis, subapteris.
Hab. in sphagnosis, a sinu *Hudsonis* ad lacus *Mistassins.*

Spach, citing the sheet in the Michaux Herbarium at Paris and Newfoundland material also there as the bases of a new species, *Betula Michauxii* Spach in Ann. Sci. Nat. sér. 2, xv. 195 (1841), emphasized the "ramis . . . novellis tomentosis" ["glaberrima"—Michx.], "foliis . . . cuneato-flabelliformibus" ["subcuneato-orbiculatis"—Michx.] and "Strobilis . . . squamis ovato– v. oblongo-lanceolatis" ["profunde 3-partitis"—Michx.]

Until recently I did not realize that Michaux was not describing his own material but was giving a compiled or copied diagnosis of the European *Betula nana* L. Across the southern half of the Labrador Peninsula, from north of the Straits of Belle Isle to the region of Hudson Bay, dwarf and depressed states of

both *B. glandulosa* (with glabrous branchlets, subrotund leaves and 3-lobed bracts) and of *B. pumila* L. (unnoted by Michaux) occur, and since nothing matching the characteristic Newfoundland shrub had been reported from west of the Côte Nord of Quebec, I assumed that the shrub from between Hudson Bay and Lake Mistassini must be one which fitted Michaux's description. Consequently, in Rhodora, xlvii. 326, t. 975, figs. 1–4 (1945), reasoning that the name *B. Michauxii* must be retained for the Michaux element (whatever that might prove to be) with glabrous branchlets, suborbicular leaves and deeply 3-lobed bracts (although Spach had not given these characters)—consequently, I named the characteristic Newfoundland shrub with densely pubescent branchlets, cuneate-flabelliform leaves and unlobed bracts and plump and wingless nutlets, *Betula terrae-novae* Fern.

Now, however, Professor Jacques Rousseau, exploring in Ungava, has recently found characteristic *Betula terrae-novae* in bogs along George River, thus proving that this distinct shrub actually occurs in the general region assigned by Michaux for *B. nana*. Then, securing a photograph of the Michaux sheet (their plate 1156) at Paris, he and his associate, Marcel Raymond, have presented (as Part 2, following) a carefully reasoned discussion, demonstrating that Michaux did not give a description of his own material but, assuming that he had the European *B. nana*, had contented himself by the easy copying or compiling of a European account of the latter species.

Since the photograph of the Michaux sheet, the type of *Betula Michauxii*, did not show with absolute conclusiveness the simplicity of possible lobation of the bracts nor any of the plump and wingless samaras, it seemed to me wise to have the matter settled beyond any possible doubt. Therefore, I took advantage of the helpfulness of my always friendly correspondent, M. Pierre Senay, who had looked into other problems for me at the Herbarium of the Muséum National d'Histoire Naturelle in Paris. He and M. Paul Jovet of the Muséum made a close study of the type and M. Jovet made a sketch (their fig. 1) of a portion of a fruiting ament under a binocular. The main portion of M. Jovet's drawing and of M. Senay's accompanying letter are included as part 3 in this brief but significant series of articles.

They clearly demonstrate that the conclusions of Rousseau and Raymond are fully justified and that the name *B. terrae-novae* is superfluous. It also becomes evident that caution must be exercised in ascribing to Michaux (or his editor, Richard) originality in all descriptions published in Michaux's great work. Incidentally and most embarrassingly, it must be recorded that, at this late date (after a lapse of nearly half-a-century) I find, on looking up the memoranda made by me when studying Michaux's Herbarium in 1903, I then made the soon forgotten note regarding his full sheet of branchlets of *Betula nana:* "= *Michauxii*, Spach! splendid specimens with constant characters".

2. BETULA MICHAUXII SPACH IN NORTHEASTERN AMERICA

Jacques Rousseau and Marcel Raymond

(Plate 1156)

A dwarf birch, collected by André Michaux somewhere along the Rupert River or one of its branches: "Hab. a sinu Huds. ad lacus Mistassinos in sphagnosis", is described in *Flora boreali-americana.* (1). Michaux believed the shrub to be the arctic *Betula nana* L. A superficial examination of the two shows a close resemblance. However, the fruiting scales in one differ markedly from those in the other: entire or nearly so in Michaux' plant, they are trilobate in true *B. nana* L.

Later on Spach (2), having both Michaux' and probably La Pylaie's specimens on hand, described the plant as a new species under the name *B. Michauxii* and placed it in his new section Apterocaryon.

In 1945 (3), Professor Fernald rejected Spach's name and redescribed the small birch of Newfoundland and adjacent Labrador, excluding Michaux' plant, which he had not seen at the moment. He called it *Betula terrae-novae,* on the assumption that *Betula Michauxii* Spach "had so confused a start". The confusion stemmed from two facts: the description which appears in *Flora boreali-americana* was not based completely upon the Michaux-plant, but partly on some European or Asiatic collection or description. In fact, there is in Michaux' herbarium a specimen of true *B. nana* L. with the indication: "Hortus Tri-

anonensis. Seminib. e Siberia missis Richard." Consequently the "amenti squamis" are given as "profunde 3 partitis". The phrasing differs in no way from the classical description of the arctic *B. nana* L., which one finds repeated, with only slight variations, from one author to another: MICHAUX, WILLDENOW, PURSH, etc. The second reason FERNALD gives is that in SPACH's description, the "strobili" are described as "4–9 pollices longi", instead of "4–8 lineas longi".

A look at the reproduction of MICHAUX' specimen (Plate 1156) leaves little doubt as to its identity, which has long since been accepted by REGEL (4), WINKLER (5), among others. The size of the strobiles in the MICHAUX plant differ little if any from that of the Newfoundland plant considered as the type of *Betula terrae-novae*. SPACH, a keen student of trees, doubtless had in mind MICHAUX' specimen. He mentions not only that his new species is "Betula nana Michx! Flo. Bor. Amer. exclus. syn." but affirms that he saw the specimen in the herbarium of the Muséum d'Histoire Naturelle in Paris. It is quite fitting, since the specimen collected by MICHAUX served as type in the description of his new species, that SPACH should choose the name of its collector as the specific epithet.

The description reads as follows:

Sectio II. APTEROCARYON Nob.

Nuculae apterae, margine incrassato, intus suberoso, cinctae.—Squamae strobileae semper 1-carpae, integerrimae, nuculis duplo angustiores (ideoque illas per maturationem haud obtegentes).

B. MICHAUXII Nob.—*Betula nana* Michx.! Flor. Bor. Amer. (exclus. syn.)—Fruticosa; ramis divaricatis v. diffusis: novellis tomentosis, impunctatis. Foliis subcoriaceis, reticulatis, glabris, impunctatis, subsessilibus, cuneato-flabelliformibus, inciso-serratis, v. crenato-dentatis, basin versus integerrimis. Strobilis sessilibus, cylindraceis, gracilibus, foliis longioribus; squamis ovato– v. oblongo-lanceolatis, v. oblongis, obtusis, v. acutis, v. acuminatis, apice laxis v. subsquarrosis. Nuculis ovatis v. subrotundis.—America borealis et insula Terrae Novae. (V. s. sp. in Herb. Mus. Par.)

Frutex humilis, ramosissimus, habitû et foliis *Betulae nanae* similis. Folia 3–6 lineas longa, lucida, petiolo tenui, brevissimo. Strobili 4–8 pollices (sic!) longi, squamis nuculis paulò longioribus.

In addition to the very characteristic fruiting scales, the shape of the leaves is also striking: "cuneato-flabelliformibus" stated SPACH; "late cuneato-flabelliformibus" writes FERNALD. It

could be added that *Betula nana* L. β. *flabellifolia* Hooker (in *Flora boreali-americana* II. 157. 1838) probably belongs here, and would be the oldest varietal name.

Spach or the typographer made the lapsus calami "4–8 pollices longi". The diagnosis should read "4–8 lineas longi". Otherwise, in the description, it is quite obvious that Spach would have not only stated "strobilis sessilibus, cylindraceis, gracilibus, foliis longioribus", but "multo longioribus", since a dwarf plant with strobiles 4–8 inches long would be striking enough to catch any taxonomist's attention!

As Spach clearly had Michaux' plant in mind (the specimen bears his personal annotation); as the mention "4–8 pollices longi" is doubtless a typographical error; as unintentional typographical errors are not sufficient grounds to reject the name of a plant; as otherwise there is no doubt about Spach's description, and that, furthermore, study of the Michaux' specimen confirms the aforementioned views, Spach's name must be restored as the valid name, and *B. terrae-novae* placed amongst its synonyms. Moreover Michaux' specimen must be considered the type.

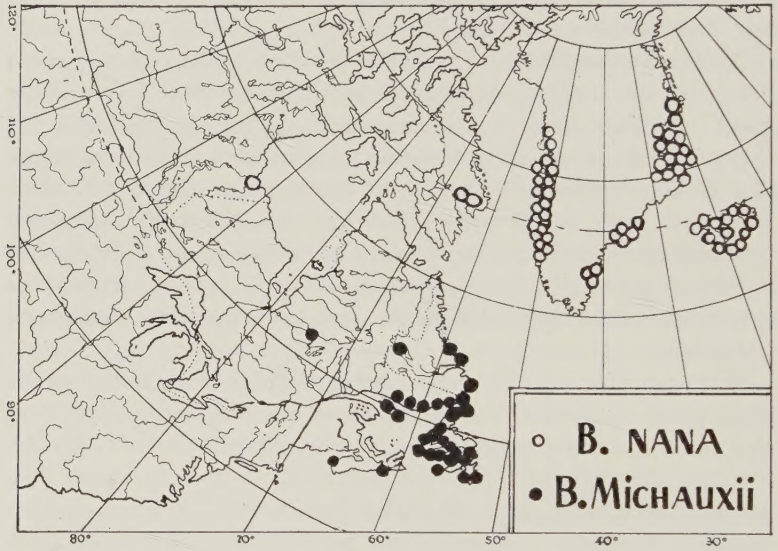
Winkler (loc. cit.: 70) gives a good description and an accurate illustration of *Betula Michauxii*, based on Michaux' plant and also on a specimen collected in Newfoundland, probably by La Pylaie. He writes: "Vidi specimen alterum in herb. musei bot. berolinensis a cl. A. Richard datum cum nota" "America septentrionalis Michaux", alterum in herb. Boiss. in Terra nova collectum. B. nana Michx. Fl. bor. Amer. II (1803) 180 non huc trahenda".

As early as 1902, Professor Fernald (6) clearly understood *B. nana* var. *Michauxii*, which, in 1861, Regel first lowered to the rank of a variety of *B. nana*, but later, in 1868, restored to its rank of species.

The senior author spent four summers botanizing in the Lake Mistassini area but, after careful search, is still unable to report finding *B. Michauxii* there. However, the birch was not collected in the immediate environs of Lake Mistassini, according to the label Michaux himself wrote (compare the calligraphy with that in the manuscript of his diary), but rather in the region between Lake Mistassini and Hudson Bay. In an attempt to

reach James bay, MICHAUX travelled westward to a distance of about 78 miles from Lake Mistassini before giving up because of the lateness of the season (7).

The occurrence of *B. Michauxii* at this latitude in the interior is hardly out of the ordinary, since the senior author of this note collected it in Eastern Ungava, on Hubbard Lake, at the head of George River, at 54° 46′ Lat. N., where it grows abundantly in peat-bogs. Among other new localities in Québec, we may also



MAP 1. Map of BETULA MICHAUXII Spach drawn from specimens deposited in the MARIE-VICTORIN Herbarium, from literature and from a complementary sketch provided by Prof. FERNALD.—Distribution of *B. nana* in Northeastern North America from literature, mainly BÖCHER (loc. cit.).

include Anticosti Island (*Rousseau*), where the shrub is common in the peat-bogs which cover the center of the island. Apparently, it has never been reported from stations along the coastline.

Compiled from herbaria and literature, below is a list of the collections of *Betula Michauxii* Spach known to us. Map 1 shows, in addition to these cited stations, others which are represented in the Gray Herbarium, the dots taken from a sketch-map supplied by Professor Fernald.

LABRADOR: Blanc Sablon, *Fernald & Wiegand* 3269 (8).

Quebec: Between Hudson Bay and Lake Mistassini, *Michaux* (1792).—Along George River (Hubbard Lake), in Eastern Ungava, *Rousseau* 36.—North Shore of the St-Lawrence: Natashkwan River, *C. W. Townsend.*—Lagorgendière: Romaine, *St. John 90 386.*—Kegaska, *Lewis.*—Harrington Harbour, *Lewis* (9).—Pointe-aux-Esquimaux: au bord des étangs de la tundra derrière le village, 11 juillet 1924, *Marie-Victorin & Rolland-Germain 18 876.*—Anticosti: au centre de l'île, entre le 10e mille de la Rivière au Saumon et la source du Crique à la Chaloupe; dans une tourbière, 13 juillet 1942. *Jacques Rousseau 52 263.*—Entre la source de la Rivière Vauréal et la source de la Rivière au Saumon, au centre de l'île. Dans une tourbière, 10 juillet 1942, *Jacques Rousseau, 52 172.*

Nova Scotia: Liscomb River, Gusboro Co., *E. R. Faribault* (1884). New to the flora of Nova Scotia. Faribault, a geologist, still living, has extensively surveyed gold-bearing series in Nova Scotia. He made some botanical collections which are included now in the Marie-Victorin Herbarium. [The dot indicated for extreme western Nova Scotia indicates its occurrence in bays of Brier Island, Digby County, where it was recently discovered by Dr. Roland.—M. L. F.]

Newfoundland: numerous collections by *La Pylaie, Waghorne, Fernald & Wiegand, K. P. Jansson,* at Cape Ray, Burgeo, Long Range, Goose Pond.

Saint Pierre et Miquelon: Arsène (10).

Betula Michauxii is indeed very close to *Betula nana.* Recently (11), Professor Eric Hultén described *Betula nana* L. ssp. *exilis* (Sukatch.) Hultén var. *reducta* Hultén, from Alaska, which shows "peculiarly reduced catkin-scales corresponding to those of *B. Michauxii* (*B. nana* var. *Michauxii*) of the Lower St. Lawrence R. distr., Newfoundland and Labrador".

Betula nana has not as yet been reported from Quebec. Consult the map in Hegi (12). But since it occurs in Eastern and Western Greenland (13), and as Dr. N. Polunin (14) made a collection in Central Baffin (see our own map), it may probably turn up some day in Ungava and then fill the distributional gap between Baffin and Western Alaska.

The authors wish to thank cordially Mr. James Kucyniak for his help in the drafting of this article.

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Montreal Botanical Garden

3. THE TYPE OF BETULA MICHAUXII

Pierre Senay and Paul Jovet

[The text is taken from a letter of M. Senay, dated August 28, 1949. The figure is from drawings (enlarged) by M. Jovet.—Eds.]

Dear Mr. Fernald.

From the result of my examination of the type specimen of *Betula Michauxii* Spach, "*B. nana* L." of Michaux, you will undoubtedly see that the investigation was most useful indeed.

(1) Pubescence:—From the top downwards the branchlets are covered with very short indumentum (nearly felt-like), dense about the tip; then the density decreases and, in the portion between five and ten centimeters below the apex, the branchlets begin to become more or less pubescent, then glabrescent and are completely glabrous below 10 cm. or so.

No glands (particles of dust should not be mistaken for such).

The color of the hairs follows the same pattern; the top ones are russet-gray, and the lower ones grayish-white, and, in the portion between 5 and 10 cm., there is a mixture of both. There is no sharp line of demarcation regarding either the density or the color of the hairs, the differentiation is progressive from the top downward.

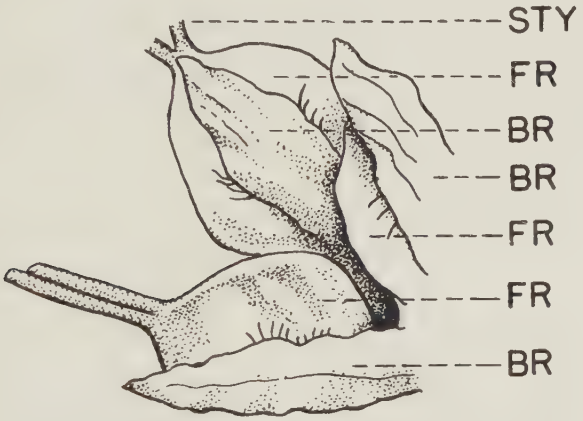

Fig. 1. Enlarged Bracts and Fruits of Betula Michauxii (after *Jovet*).

A very young ament is covered with silvery-grayish-white hairs reaching 0.5–0.6 mm.

Last but not least:

(2) Squamae:—At first glance, without lens, they really look 3-lobed and no better comparison may be made than with minute *Polygala*-like fruits in which the fruit exceeds both sides of the "wing". And this certainly led Michaux into error.

Actually, the squamae are entire and, under the lens, slightly ciliolate on the margins. There cannot be any hesitation on this point. So those of your botanists who have seen them unlobed are quite right.

The specimens were examined conjointly by Jovet, who made the drawings (fig. 1) "in sicco", and myself.

Asnières (Seine)

A Note on the Varieties of Zizania aquatica L.—In September, 1949, a number of specimens of wild rice were collected along the St. John River at Fredericton in York County, and at Hamstead in Queens County, New Brunswick. It was at once evident that many of the plants in these stands exceeded the stature of *Zizania aquatica* L. var. *angustifolia* Hitchcock, supposedly the only variety occurring in New Brunswick[1]. Plants ranging from less than 1 m. in height up to 2.5 m. were noted, whereas the maximum for the var. *angustifolia* as described by Fassett is 1.5 m. Moreover, it appeared that the size was correlated with the ecological conditions, smaller plants occurring on the more sandy mud.

The specimens collected were determined with the aid of N. C. Fassett's key and specimens in the Gray Herbarium and the Herbarium of the New England Botanical Club. Some of the material could be referred to the var. *angustifolia;* much of it fell under *Z. aquatica* var. *interior* Fassett; and some of it was intermediate, possessing some characters of each. In addition to stature, the characters used in determination were the purely quantitative ones of ligule-length, leaf-width, and the number of staminate and pistillate spikelets per branch. Specimens referable to both varieties, as well as intermediate forms, occurred in the same stand, growing close together, the differences seemingly correlated with local conditions. It is interesting to note that in the areas visited material which would fit the var. *angustifolia* completely was in the minority.

From these observations we feel that one of two possible conclusions should be drawn. Either the var. *interior* extends much farther eastward than the range originally ascribed to it by Fassett, or the two varieties *angustifolia* and *interior* are not distinct in New Brunswick.—Taylor A. Steeves, The Biological Laboratories, Harvard University, and Gordon P. DeWolf, Jr., Chelmsford, Mass.

[1] Fassett, N. C., A Study of the Genus Zizania, Rhodora 26: 153–160, 1924.

SOME ADDITIONS TO THE OKLAHOMA FLORA

U. T. Waterfall

(*Continued from page 24*)

Itea virginica L. was collected as *Waterfall* 8496, edges of *Taxodium* swamps, 9 miles east and 2 south of Broken Bow, McCurtain County, August 8, 1948. We have in our herbarium only one previous collection from the state, *Stevens* 2652, near Page, Leflore County, September 7, 1913.

*Desmodium rotundifolium (Michx.) DC. Referred to this species is *Waterfall* 8221, steep wooded banks 3 miles west of state line (west of Siloam Springs) and 2½ miles north, Delaware County, July 8, 1948.

Although the plant is just beginning to flower, the characteristic leaf shape, and the large, ovate, striate, attenuate stipules seem to make the determination fairly safe.

*Erodium texanum Gray was collected as *Waterfall* 8722, shallow silty clay on gypsum, 6 miles south of Hollis, Harmon County, August 26, 1948. *Waterfall* 8362, top of mesa, 6 miles east and 1½ north of Eldorado, Jackson County, July 23, 1948; *Waterfall* 8354, shallow silty soil on gypsum 5 miles north and 2 west of Eldorado, Jackson County, July 23, 1948.

This species is not listed by Stemen and Myers (*op. cit.*), Jeffs and Little (*op. cit.*), or Stevens (*op. cit.*). Small[1] states that the distribution is from "Texas to middle California and lower California." The cited specimens constitute a northward extension of range into Oklahoma.

*Parthenocissus quinquefolia (L.) Planch, forma hirsuta (Donn.) Fernald. In our herbarium we have several sheets of the pubescent form taken from scattered localities.

*Passiflora incarnata L., forma **alba** f. nov., corollis lobae et coronis albis. The type is *Waterfall* 8198, two miles east of Choteau, Mayes County, July 7, 1948. It is in the Bebb Herbarium of the University of Oklahoma.

Although the author knows of the white flowered form only from this area, he is describing it as a forma rather than a variety, since its range is not known to exceed that of the typical form, and since it is only a minor variant.

[1] Small, J. K. and Linda Tracy Hawks. *Geraniaceae*, N. Am. Fl. 25 (1): 22. 1907.

Cynosciadum digitatum DC. was collected as *Waterfall* 8049, swamps 3½ miles south and 2 east of Tom, McCurtain County, June 23, 1948.

Although listed by Jeffs and Little (*op. cit.*) and Stevens (*op. cit.*) we have no confirming specimens in our herbarium. Mathias and Constance[1] state that the species is distributed from "southern Missouri to eastern Texas", which range could easily include the extreme southeastern part of our state where the above cited number was taken.

*Limonium limbatum Small. Referred to this species is *Waterfall* 8319, valley of the Red River, 3 miles west and 7 south of Hollis, Harmon County, July 21, 1948.

This is the only representative of the *Plumbaginaceae* known from Oklahoma.

*Cynoctonum Mitreola (L.) Britton. So referred is *Waterfall* 8508, growing in pond, 6 miles north of Broken Bow, McCurtain County, August 9, 1948.

The genus is not recorded from our state in current manuals and check lists. In Gray's Manual[2], the range of *C. Mitreola* is stated to be "Virginia to Texas." Cory's statement of range (*op. cit.*) includes his area 1, the "Timber Belt", which is adjacent to the part of Oklahoma from which the above collection was made.

Nymphoides peltatum (Gmel.) Kuntze was taken as *Waterfall* 8503, growing in pond, 6 miles north of Broken Bow, McCurtain County, August 9, 1948. Growing with it was *Cynoctonum Mitreola.*

Stratton[3] has previously reported *N. peltatum* (without specimen citation) from Bryan County, Oklahoma.

*Asclepias longicornu Benth was collected as *Waterfall* 8592, growing in silty clay (with *Euphorbia albomarginata, Panicum texanum, Physalis lobata* and *Ditaxis humilis*) 2 miles south of Okeene, Blaine County, August 20, 1948 and *Waterfall*

[1] Mathias, Mildred E. and Lincolm Constance. *Umbelliferae.* N. Am. Fl. 28B (2): 164. 1945.

[2] Robinson, B. L. and M. L. Fernald. *Gray's New Manual of Botany.* Ed. 7. 1908.

[3] Stratton, Robert. *Some Oklahoma Vascular Plants.* Proc. Okla. Acad. Sci. 28: 62–65, 1948.

8606, growing in silty clay (with *Euphorbia albomarginata*) 10 miles west of Orienta, Major County, August 20, 1948.

These collections represent considerable northward extensions of range from areas where it has been known previously. Small[1] says "Texas to New Mexico and Mexico." Cory[2] states that it occurs in areas 2, 4, 5, and 6, i. e., coastal, central, and southwestern Texas. The species should be found between the areas listed by Cory and the region of my present collections.

*Convolvulus hermannioides Gray. So referred is *Waterfall* 7783 collected on a dolomite knoll, 3 miles north of Duke, Jackson County, June 4, 1948.

The auricled sepals are about a centimeter long. Associates include *Aphanostephus ramosissimus* (not *A. pilosus*) and *Gaillardia pinnatifida*. *C. hermannioides* has been known previously from Texas.

*Cressa truxillensis HBK. was collected as *Waterfall* 8318, valley of the Red River, 3 miles west and 7 south of Hollis, Harmon County, July 21, 1948. It is fairly abundant in the river valley.

Cory (*op. cit.*) does not list the species from the adjacent plains country in Texas. Tidestrom and Kittell[3] say that it occurs from Utah to California, southward to Texas, Mexico, and South America.

Cuscuta glabrior (Engelm.) Yuncker. Referred to this species is the author's 8680, from sandstone buttes, south of Tesequite Creek, 1 mile west and 4 south of Kenton, Cimarron County, August 24, 1948.

This species is not recorded in Jeffs and Little's list (*op. cit.*). The combination itself was not made until two years[4] after the publication of the list, but the name, *C. verrucosa* Engelm., not Sweet, applied to this species concept in 1930 is not on the Checklist. In the Flora of Texas,[5] Yuncker states that the

[1] Small, J. K., *op. cit.* 948. 1913.

[2] Cory, V. L., *op. cit.* 83. 1938.

[3] Tidestrom, Ivar and Sister Teresita Kittell. *A Flora of Arizona and New Mexico.* 583. 1941.

[4] Yuncker, Truman G. *The Genus Cuscuta.* Mem. Tor. Bot. Cl. **18** (2): 140–141. 1932.

[5] Yuncker, T. G., *Cuscuta* in flora of texas. **3** (2): 131–132. 1943.

species "ranges from New Mexico to Oklahoma and Louisiana and southward into northeastern Mexico."

Dichondra repens Forst., var. carolinensis (Michx.) Choisy has been previously reported[1] from LeFlore County. It is now known from McCurtain County as *Waterfall* 8062, woods 3½ miles south and 2 miles east of Tom, June 23, 1948, and *Nelson, Nelson* and *Goodman* 5574, moist, sandy openings in costal plain forest, near Harris, April 20, 1946.

*Heliotropium inundatum Sw. This species was collected as *Waterfall* 8451, edge of Big Grassy Lake, 4 miles west and 4 south of Tom, McCurtain County, August 7, 1948.

Small[2] says the species occurs "in low grounds, Louisiana to California."

*Verbena plicata Greene. Referred to this species is *Waterfall* 8663, stony soil near West Carrizo Creek north of the Black Mesa, 3 miles north and 1 west of Kenton, Cimarron County, August 23, 1948, and *Waterfall* 8347, silty soil in valley between gypsum ridges, 6½ miles south of Hollis, Harmon County, July 22, 1948.

Perry[3] does not list the species from Oklahoma, but cites it from Texas, New Mexico, Arizona, Chihuhua, and Coahuila.

*Hedeoma pulegioides Pers. Referrable to this species is *Bebb* 5992, in woods, Adair County, Sept. 26, 1940.

Epling[4] includes Kansas and Arkansas in his statement of the range of the species.

*Monarda punctata L., var. **intermedia** (McClintock and Epling), stat. nov. (*M. punctata* L., ssp. *intermedia* McClintock and Epling. *A Review of the Genus Monarda.* Univ. of Calif. Publ. in Bot. **20:** 184–185. 1942). *Waterfall* 8416 is apparently referrable to var. *intermedia.* The corollas are yellowish, and are purple-punctate. They have unexpanded tubes 6–7 mm. long, the calyx-tube has an orifice that is hairy, but not closed. These are key characteristics used by McClintock and Epling for their ssp. *intermedia*, "plants of the Texas prairie, mostly

[1] Hopkins, Milton. *Notes from the Bebb Herbarium of the University of Oklahoma.* II. Rhodora **45:** 275. 1943.

[2] Small, J. K. *Flora of the Southeastern United States.* 1913.

[3] Perry, Lily M. *A Revision of the N. Am. Spp. of Verbena.* Ann. Mo. Bot. Gar. **20:** 294–296.

[4] Epling, Carl and Wm. S. Stewart. *A Revision of Hedeoma . . .* Rep. Spec. Nov. **115:** 26–27. 1939.

east of the Brazos River." The author's collection was taken from sand, north of Clear Lake, 10 miles west and 1½ south of Idabel, McCurtain County, August 6, 1948.

CASTILLEJA INDIVISA Engelm. Pennell[1] cited only two collections from Oklahoma, one from Bryan County and one from Delaware County. From Atoka County I have *Waterfall* 7991, prairie, 1 mile south and 3 west of Atoka, June 21, 1948.

*SYMPHORICARPOS OCCIDENTALIS Hook. This species was collected as *Waterfall* 7945, canyon between sandstone hills, 6 miles south and 1 west of Kenton, Cimarron County, June 14, 1948.

Jones[2] lists no collections from Oklahoma, but cites the species from Kansas, Colorado and New Mexico.

*BAHIA WOODHOUSII Gray. Specimens of *Bahia* taken as *Waterfall* 7878, ditch in plains west of Boise City, Cimarron County, June 12, 1948 are referred to the above species by virtue of the prominent excurrent midrib of the pappus palea, and the achenes having an indument which is hirsutulous, becoming longer toward the base.

Kearney and Peebles[3] state that the range of the species is "Northwestern Texas, Colorado and northern Mexico." Stemen and Myers[4] report *B. oppositifolia* from Cimarron County. The author has seen no confirming collection.

*BERLANDIERA TEXANA DC., var. BETONICAEFOLIA (Hook.) T. & G. The author is referring to this variety his no. 8079 taken from a wooded creekside, 4 miles north of Broken Bow, McCurtain County, June 24, 1948.

This collection is characterized by long, jointed purplish hairs which cover most of the upper part of the stem including the peduncles. This is as Torrey and Gray[5] described var. *betonicaefolia*. They also state that the leaves are "all petioled". The upper cauline leaves of the present collection are sessile. However, Torrey and Gray further state: "Most of the specimens from Dr. Hale (western Louisiana) . . . have the peduncles and upper part of the stem clothed with purplish hairs . . .

[1] Pennell, *The Scrophulariaceae of Eastern Temperate North America*. 541. 1935.

[2] Jones, George Neville. *A Monograph of the Genus Symphoricarpos*. Journ. Arn. Arb. **21**: 224–228. 1940.

[3] Kearney, Thomas H. and Robert N. Peebles. *Flowering Plants and Ferns of Arizona*. 1942.

[4] Stemen, Thomas R. and W. Stanley Myers, *Oklahoma Flora*. 1937.

[5] Torrey, John and Asa Gray, *Flora of North America* **2**: 281.

just as Hooker describes his *Silphium betonicifolium*, but the upper leaves are all sessile, as in DeCandolle's plant . . .". It is just such material that the present author has, and which he is referring to var. *betonicaefolia*. Torrey and Gray cite material of this variety from Texas, western Louisiana and western Arkansas. In our herbarium none of the other Oklahoma material collected from widely separated localities has such indument.

*Eupatorium incarnatum Walt. Referred to this species is *Waterfall* 8430, margin of Red Lake, 12 miles west and ½ south of Idabel, McCurtain County, August 6, 1948.

*Helianthus angustifolius L. Referred to this species is *Waterfall* 8466, abandoned field, 2 miles north of Tom, McCurtain County, August 7, 1948.

In Small's *Flora* the range is given as "New York and Missouri to Florida and Texas."

*Liatrus pycnostachya Michx., forma **alba,** f. nov., corollis stylis et phyllariis albis.

The white flowered form was found abundantly intermingled with the common colored form, on a prairie 9 miles west and 1 mile south of Wapanucka, Johnston County, on August 5, 1948. It was collected as *Waterfall* 8396, which is designated as the type, and placed in the Bebb Herbarium of the University of Oklahoma. Isotypes will be sent to the Gray Herbarium and the herbaria of the New York and Missouri Botanical Gardens.

Liatrus squarrosa (L.) Michx., var. hirsuta Rydb. ex Gaiser. In her monograph of *Liatrus* Gaiser[1] cites one sheet from Oklahoma. It is *Waterfall* sin num., Tuskahoma, Pushmataha County, June 20, 1937. To this variety may also be referred *Waterfall* 8425, upland woods, 1 mile south and 2 west of Garvin, McCurtain County, August 6, 1948.

Pectis angustifolia Torr. has been previously reported[2] within the state based on *Demaree* 13,351 collected in 1936 from Cimarron County. The present author found the species growing in abundance in shallow sand on top of sandstone buttes near or under *Pinus ponderosa* and *P. cembroides* var. *edulis* south of Tesequite Creek, 1 mile west and 4 south of Kenton,

[1] Gaiser, L. O. *The Genus Liatrus*, Rhodora **48**: 401. 1946.

[2] Goodman, Geo. J. and U. T. Waterfall, *Notes on Oklahoma Plants*. Proc. Okla. Acad. Sci. **28**: 66. 1948.

Cimarron County, August 24, 1948. This is the only place in the state where the author has seen *Pectis* growing.

Specimens of the author's plants mentioned in the above enumeration will be found in the Bebb Herbarium of the University of Oklahoma. Available duplicates will be distributed to a few other herbaria at a later date.

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NEW RECORDS FOR THE BRUCE PENINSULA, ONTARIO

Dale J. Hagenah

Intensive field work whenever it has been possible to get away for a few days in that Mecca of botanists, the Bruce Peninsula of Ontario, has resulted in the finding of a number of additions to its known flora. During the past five years, in addition to species not reported by the late P. V. Krotkov in the systematic list in his "Botanical Explorations in the Bruce Peninsula, Ontario" (Trans. Roy. Can. Inst. **23** (1): 3–65. 1940), new stations have been found for several rare species reported by him. Records new for the area are indicated by an asterisk in the following list.

Particular attention has been given to the Pteridophyta and the Orchidaceae of the area and all the new records here reported are in these groups. A number of the finds, especially in the Orchidaceae, are due to Mrs. Hagenah's eye for botanical novelties. Specimens of all species not reported by Krotkov and of most of the others have been deposited in the Billington Herbarium of the Cranbook Institute of Science, Bloomfield Hills, Michigan. All numbers refer to collections of the author.

*Botrychium matricariaefolium A. Br. ex Koch. Specimens of this species were collected from the sides of low hummocks in a maple-birch woods three miles south of Tobermory, July 4, 1948, *75θ*.

*Botrychium multifidum (Gmel.) Rupr., var. intermedium (D. C. Eaton) Farw. Found in an abandoned pasture near the cemetery at Oliphant, October 9, 1949, *1430* and *1431*.

This Grape Fern was locally abundant, more than fifty plants being found in an area about fifty yards square, and was extremely

variable as to size of both sterile and fertile plants, with some of the smaller specimens, *1432* and *1434*, approaching var. TYPICUM in appearance.

*BOTRYCHIUM DISSECTUM Spreng., var. TYPICUM. Only one sterile plant of this species was found in a mixed woods near Red Bay, although both of the following varieties were present in both sterile and fruiting condition. October 8, 1949, *1426*.

*BOTRYCHIUM DISSECTUM Spreng., var. OBLIQUUM (Muhl.) Clute. Found in a mixed woods near Red Bay, usually in old roadways, September 6, 1948, *803*. Other plants were observed here in October, 1949.

*BOTRYCHIUM DISSECTUM Spreng., var. ONEIDENSE (Gilbert) Farw. Most of the plants seen at Red Bay in 1948 and 1949 had the broad, more rounded terminal segments of this variety. September 6, 1948, *802*.

*DRYOPTERIS PHEGOPTERIS (L.) C. Chr. One small but abundantly fruiting station was found at the edge of an opening in the swamp forest surrounding a bog southwest of the village of Lion's Head, September 5, 1948, *793*.

DRYOPTERIS FILIX-MAS (L.) Schott. This species, reported by Krotkov and others only from the vicinity of Cape Croker, was found at several places in a rocky beech-maple woods northwest of Hope Bay, at least six miles from the previously reported stations, August 31, 1947, *717*.

*DRYOPTERIS CRISTATA (L.) Gray, var. CLINTONIANA (D. C. Eaton) Underw. This variety has been collected in moist depressions in a mixed woods near Red Bay, September 6, 1948, *799*, and along a stream in woods near the Stokes Bay cemetery, October 8, 1949, *1428*.

ATHYRIUM THELYPTERIOIDES (Michx.) Desv. Reported by Krotkov from one collection made near the north shore of the Peninsula, this species was found in a moist valley between two dolomite ridges northwest of Hope Bay, July 3, 1949, *916*.

*ATHYRIUM PYCNOCARPON (Spreng.) Tidestr. Found on a low hummock at the foot of a dolomite ridge in a beech-maple woods northwest of Hope Bay, July 4, 1947, and collected August 31, 1947, *720*.

This colony bore abundant fertile fronds in 1947 but only sterile fronds were found in 1948. *Phyllitis Scolopendrium*, var. *americana* and *Polystichum Lonchitis* were abundant on the dolomite ridge while only a few yards away from the hummock on lower ground was the first clump of *Dryopteris Filix-mas* found at this station.

Pellaea atropurpurea (L.) Link.

This species was reported by Stebbins (Rhodora **37:** 63–74. 1935.) from cliffs along Georgian Bay near Gillies Lake and Lion's Head. It was rare at these locations and Stebbins stressed the fact that the cliffs appeared to have escaped the fires which had ravaged much of the Peninsula in the past. However, on October 8, 1949, this species was collected from a low rocky ridge in the dolomite pavement country about six miles west of Dyer's Bay, *1429.* Although there are obvious signs of past fires throughout this pavement region the *Pellaea* was not only abundant along the ridge but was occasionally seen in crevices between layers of the pavement itself.

*Lycopodium obscurum L., var. dendroideum (Michx.) D. C. Eaton. One small colony of the Round-branched Ground Pine was found on a sandy ridge in mixed woods near Red Bay, September 6, 1948, *798.*

*Lycopodium complanatum L., first found near the Stokes Bay cemetery on October 8, 1949, *1427,* and again the next day at the foot of a sand ridge marking an old Lake Huron shore line south of Oliphant, October 9, 1949, *1443.*

*Lycopodium tristachyum Pursh. Collected from another sand ridge near Oliphant, August 26, 1946, *397.*

At other places in this same series of wooded ridges collections have been made which resemble this species in form but lack its bluish-green color.

Cypripedium Calceolus L., var. parviflorum (Salisb.) Fern.

Under the name *Cypripedium parviflorum* Salisb. this yellow lady's-slipper was reported as common by Krotkov while the variety *pubescens* was reported only from one collection by A. B. Klugh. Five seasons of field experience in the Peninsula during the blooming season have shown that the actual frequency of the two is the reverse of that given by Krotkov. Variety *parviflorum* with its characteristic dark wine-colored sepals and petals has been found at only one locality, Little Port Elgin, May 31, 1946, *311.* Variety *pubescens* with its greenish-yellow sepals and petals occurs throughout the Peninsula in a variety of habitats, even growing in small pockets of humus in the dolomite pavement district.

*Habenaria clavellata (Michx.) Spreng., var. ophioglossoides Fern. Found growing in moss at the edge of the thicket

surrounding a small bog near Lion's Head, August 31, 1947, *726*. *Cypripedium acaule* was found near by.

Habenaria orbiculata (Pursh) Torr. This species, reported only from Stokes Bay by Krotkov, was observed in a mixed woods near Red Bay in 1948 and 1949.

*Habenaria Hookeri Torr. Found in a sandy opening in coniferous woods near the shore at Dorcas Bay, May 31, 1947, and collected in bloom on July 4, 1947, *639*.

Interesting species noted near by included *Cypripedium arietinum* and *Iris lacustris*.

*Arethusa bulbosa L. Collected from grassy margins of a marly bog near Lion's Head, July 4, 1947, *638*.

Listera cordata (L.) R. Br.

This species was reported by Krotkov from Cove Island, off the tip of the Peninsula, and then only from a solitary specimen. Stebbins (l. c.) mentioned seeing it at Red Bay. This station has not been rediscovered but this elusive little orchid has been found at three places in the vicinity of Oliphant where it is sometimes abundant in small areas, May 30, 1946, *306*. It has also been observed in a mossy thicket in a bog near Lion's Head. In nearly every case it has been associated with *Habenaria obtusata*.

Malaxis brachypoda (Gray) Fern. Reported by Krotkov from a collection by [? R. F.] Cain at Sauble Beach, this species was found at two locations in the Oliphant area on July 4, 1949, *917*.

*Corallorrhiza maculata Raf., forma flavida (Peck) Farw. This form, with the entire plant yellow except for the white, unspotted lip, was found to be rather frequent in one section of a wooded slope below a cliff at Sydney Bay, July 6, 1946, *342*.

Although the typical form of the species is commonly met with elsewhere in the Peninsula, it was not here observed in the same locality with the form. However, both have since been found growing in the same woods at Hope Bay.

Calypso bulbosa (L.) Oakes. Like *Listera cordata*, this orchid was reported by Krotkov from a single specimen found on Cove Island. On May 31, 1947, three plants, two with flowers, were found near Oliphant in a low coniferous woods where *Listera cordata* is abundant.

However, it may have been overlooked elsewhere because of its early blooming habit. In this connection, it may be noted

that 1947 was a late season in this area and that large snow banks were still present in arbor vitae thickets near where the *Calypso* was found in bloom.

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ANDROPOGON ELLIOTTII CHAPM. IN ILLINOIS

Robert A. Evers

The Elliott Beardgrass, principally of the coastal plains from New Jersey to Florida and Texas, extends northward to southern Missouri and southern Indiana (Hitchcock, 1935) but has not been reported to occur in Illinois. Palmer and Steyermark (1935) listed it in four Missouri counties, and Deam (1940) credited it to ten Indiana counties.

In November, 1939, L. E. Yaeger collected this grass three miles southeast of Ridgway, Gallatin County, Illinois. He found it growing in an old upland field along with persimmon, Smilax and Panicum species. This appears to have been the first collection of this grass in Illinois.

In September, 1947, I attempted to find the site of Yaeger's collection but was not successful. In April, 1949, Glen S. Winterringer collected the grass in Pope County near Waltersburg. This collection was the first after Yaeger's in 1939.

In October, 1949, while collecting plants in southern Illinois, I made ten collections of *Andropogon elliottii* in five counties. I found it chiefly in old fields associated with *Andropogon virginicus*. It formed rather large colonies, or it occurred as isolated tufts. With the exception of Yaeger's collection near Ridgway, all collections are from the southern unglaciated area of the state. Although within the glacial boundary (Illinoian), the Ridgway site is not on glacial till but on the broad, sandy terrace (Wisconsin outwash) in the Wabash valley.[1] Deam has characterized this species in Indiana as being "restricted practically to the unglaciated area where it is usually found with

[1] Personal communication from Dr. George E. Ekblaw, Illinois State Geological Survey, Urbana.

Andropogon virginicus"; the same characterization fits entirely its known occurrence in Illinois.

Although present records show Elliott Beardgrass in only five southeastern Illinois counties, further field work may reveal its presence in other southern counties.

The following is a list of specimens of *Andropogon elliottii* in the herbarium of the Illinois State Natural History Survey.

Gallatin Co.: In an old upland field, 3 miles southeast of Ridgway, November 7, 1939, *L. E. Yaeger;* roadside, Pounds Hollow Recreation Area, October 25, 1949, *R. A. Evers* 21898; in a field southeast of the Pounds, near the county line, October 25, 1949, *R. A. Evers* 21900. Hardin Co.: In a field west of Karbers Ridge, October 25, 1949, *R. A. Evers* 21902; in a field east of Karbers Ridge, October 25, 1949, *R. A. Evers* 21903; in a field northwest of Rosiclare, October 26, 1949, *R. A. Evers* 21904. Johnson Co.: Field border northeast of Bloomfield, October 26, 1949, *R. A. Evers* 21908. Pope Co.: Field along highway 146, east of Waltersburg, April 3, 1949, *G. S. Winterringer* 1933 (determined by Agnes Chase); field border southeast of Herod, October 25, 1949, *R. A. Evers* 21901; in a field north of Homberg, October 26, 1949, *R. A. Evers* 21905. Saline Co.: In a field one mile southeast of Rudement, October 25, 1949, *R. A. Evers* 21860; summit of Wamble Mountain, 2¾ miles southeast of Rudement, October 25, 1949, *R. A. Evers* 21881.

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Illinois State Natural History Survey, Urbana

Two new Forms of Plants from Minnesota.—Eriophorum tenellum Nutt., f. **axillare,** f. nov., a forma typica differt pedunculo laterali ex axilla folii supremi (bracteae similis) uno- vel multo-spicato. Type: *Lakela* No. 8717, July 4, 1949, growing in *Sphagnum-Chamaedaphne* swamp on Fredenberg Lake road, Fredenberg T. 18 mi. N. of Duluth, St. Louis Co., Minnesota. (University Minn. Herb., Duluth Branch).

This form differs from the typical form by developing, in addi-

tion to the normal inflorescence, a lateral peduncle with one or more spikes, in the axil of the uppermost leaf, which has become bract-like. The plants were collected from a colony of typical plants in association with *Eriophorum virginicum* L., *Scheuchzeria palustris* L. and *Carex oligosperma* Michx.

CORYDALIS SEMPERVIRENS (L.) Pers., f. **candida,** f. nov., a forma typica differt sepalis petalisque albis, apicibus petalorum sulphureis. TYPE: *Lakela* No. 9022, July 15, 1949, growing in mats of *Cladonia* on a granite ridge, Rivard Road to Birch Lake about 12 mi. S. of Ely, Northeast St. Louis Co., Minnesota. (University Minnesota Herb., Duluth Branch).

This form differs from the typical form by replacement of the rose color of the sepals and petals by white, the petal-tips remaining yellow. These striking white-flowered plants were first observed on June 29, but only a single collection, No. 8672, was made at that time. The type material, collected two weeks later, was mostly in fruit. Britton & Brown, Illustr. Fl. of North. States and Can., Vol. 2, p. 144, refer to the color of the flower of the species as "rarely white"; the form appears to be undescribed. On drying, the sepal margins turned faint rose.—OLGA LAKELA, University of Minnesota, Duluth Branch.

ALCHEMILLA ALPINA IN COLORADO: The very characteristic *Alchemilla alpina* L., of alpine regions of Europe and common in Greenland, is generally recognized as found southward in North America only on the island of Miquelon. To be sure, Pursh, the author of countless erroneous records, wrote in his Fl. Am. Sept. i: 112 (1814):

> On the peaks of high mountains in Vermont and New Hampshire. ♃. June, July. *v. s.* Whether the American species is the true *A. alpina* or not, I am not able to determine, as I am at present in want of specimens to compare them; but the plate in the Flora Danica represents the American plant fully, as far as recollection can decide.

That was too vague. Nothing possibly identifiable with it is known from "the peaks of high mountains in Vermont", but the highest mountain of New Hampshire harbors the habitally very similar *Sibbaldia procumbens* L. Pursh gave the only station for the latter in New England as "high mountains of . . .

Vermont", although the only New England stations actually known to active explorers of our mountains are on the Mt. Washington area, chiefly near the head of Tuckerman's Ravine. For some unaccountable reason, Rydberg in N. Am. Fl. xxii[4]. 379 (1908), cites *Alchemilla alpina* southward only from "Miquelon and the White Mountains of New Hampshire". Why, if Pursh's unverified statement was being credited, discriminate against Vermont, where *Alchemilla* is equally unknown?

The object of this note, however, is not to guess what Pursh was guessing at. As a boy, before coming to Cambridge, I exchanged specimens with the late C. H. Demetrio. Among other plants he sent me was a characteristic specimen of *Alchemilla alpina*, collected by himself on July 5, 1888, "on the Trail to the Lake of the Clouds, Custer Co., Colorado". Here is a challenge to Cordilleran botanists.[1]—M. L. Fernald.

[1] I remember that Demetrio was anxious to secure mosses and lichens from Maine. Being kept out of school through a long winter and being as much as possible out of doors, on skis, I offered to collect them for him. I well remember the delight of the family with his reply: "Spare your health; do not go out in the snow-crownded forest".

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